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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,975	02/22/2002	Yoshikazu Sugiyama	10834-005001	2211

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EXAMINER
THOMAS, BRANDI N

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/081,975	Applicant(s) SUGIYAMA ET AL.
	Examiner Brandi N Thomas	Art Unit 2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2 and 3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action* .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. Acknowledgement is made of receipt of Information Disclosure Statement(s) (PTO-1449) filed 2/22/02 and 3/25/02. An initialed copy is attached to this Office Action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 5-14 are rejected under 35 U.S.C. 102(b) as being unpatentable by Muraki et al. (4974919).

Regarding claim 1, Muraki et al. discloses, as in figures 1 and 2, an illumination optical system (col. 3, lines 10-15) comprising: an afocal beam expander system (12) which expands a beam illuminated from a laser light source (11); a linear beam-forming lens system (14) at least refractive power in a second direction which is substantially at a right angle to at least a first direction (col.19, lines 21-26), the linear beam-forming lens system converting the beam, illuminated from said beam, lines expander system, to a linear beam having its long side in the first direction (col. 19, lines 56-59); a lens array section (13) having a plurality of element lenses, arranged along said first direction (col. 17, lines 53-56); and a condenser optical system (16)

which illuminates a processed face by reconnecting images of said linear beam from each of said element lenses thereon (col. 17, lines 66-68 and col. 18, lines 1-4).

Regarding claim 2, Muraki et al. discloses, as in figures 4a-4c, wherein the linear beam-forming lens system comprising a cylindrical lens (32b) having refractive power in said second direction (col. 10, lines 58-61).

Regarding claim 3, Muraki et al. discloses wherein at least one of said cylindrical lens, said lens array section, and said condenser optical system being movable along an optical axis (col. 7, lines 24-26).

Regarding claim 5, Muraki et al. discloses, as in figures 1 and 2, a condenser optical system comprising, on the side of said processed face, another cylindrical lens (16) having refractive power in said second direction (col. 7, lines 32-42).

Regarding claim 6, Muraki et al. discloses, as in figures 1 and 2, a laser light source (11) which supplies laser light; the illumination optical system (13, 14, and 16) as described in the above claims; and a scanning-moving section (15) which moves the linear beam on said processed face and said processed face in relation to each other (col. 6, lines 33-45).

Regarding claim 7, Muraki et al. discloses, as in figures 4a-4c, an illumination optical system (col. 3, lines 10-15) comprising: a prism member (31a and 31b) which splits a beam, illuminated from a laser light source (11), into a plurality of light beams in a first direction and reconnects the plurality of light beams on a predetermined face (col. 9, lines 22-33); a linear beam-forming lens system (14) having at least refractive power in a second direction which is substantially at a right angle to at least said first direction (col.19, lines 21-26), the linear beam-forming lens system converting said plurality of split beams to a linear beam having its long side

in the first direction (col. 19, lines 56-59); an expanding system (12) which expands said linear beam in said first direction, and illuminates it onto a processed face (col. 2, lines 60-64) (figures 1 and 2).

Regarding claim 8, Muraki et al. discloses, as in figure 5b, wherein the prism member (53) comprises a trapezoid prism, and the position of said predetermined face, where said plurality of light beams which were split by said trapezoid prism are connected, substantially matches the focal positions of said linear beam-forming lens system in said second direction (col. 14, lines 44-55).

Regarding claim 9, Muraki et al. discloses, as in figure 7b, wherein the expanding optical system comprising an optical system (71 and 72) which is rotationally symmetric to an optical axis (col. 16, lines 17-26).

Regarding claim 10, Muraki et al. discloses, as in figures 4a-4c, wherein the linear beam-forming lens system comprising a cylindrical lens (32b) having refractive power in said second direction (col. 10, lines 58-61).

Regarding claim 11, Muraki et al. discloses, as in figures 1 and 2, said expanding optical system comprising, on the side of said processed face, a second cylindrical lens (16) having refractive power in said second direction (col. 7, lines 32-42).

Regarding claim 12, Muraki et al. discloses wherein at least one of said first cylindrical lens and said second cylindrical lens being movable along an optical axis (col. 7, lines 24-26).

Regarding claim 13, it is inherent that the function of the beam expander is to expand the diameter of the beam. Muraki et al. discloses, as in figures 1 and 2, the beam is expanded more greatly in the first direction than in the second direction.

Regarding claim 14, Muraki et al. discloses, as in figures 1, 2, and 4a-4c, an illumination optical system (13, 14, and 16) as described in the above claims; and a scanning-moving section (15) which moves the linear beam on said processed face and said processed face in relation to each other (col. 6, lines 33-45).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muraki et al. (4974919) as applied to claim 1 above, and further in view of Shiraishi et al. (6377336 B1).

Regarding claim 4, Muraki et al. teaches a lens array section except that it does not show a first sub array section and a second sub array section. Shiraishi et al. shows, as in figure 1, that it is known to provide a first and second sub array section (40a-b and 41a-b) wherein the lenses are rotationally symmetrical to the optical axis for the prevention of light quantity loss (col. 26, lines 3-6). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Muraki et al. with the first and second sub array section of Shiraishi et al. for the purpose of providing preventing light quantity loss (col. 26, lines 3-6).

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Aiyer (5453814) discloses a method and apparatus for uniform illumination of a mask embodying a pattern to be projected onto a wafer for manufacture of semiconductor chips.

Tanaka (6393042 B1) discloses a beam homogenizer, which can unify the energy distribution of a linear laser beam in a longitudinal direction.

Oskotsky (5724122) discloses an illumination system having spatially separate horizontal a vertical intermediate image planes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 703-308-3095. The examiner can normally be reached on 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 703-308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7724 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-4883.

BNT
June 9, 2003

RICKY MACK
PRIMARY EXAMINER